



Aalborg Universitet

AALBORG UNIVERSITY
DENMARK

Hardness and Crack Resistance of Oxide Network Glasses

Smedskjær, Morten Matstrup

Publication date:
2014

Document Version
Early version, also known as pre-print

[Link to publication from Aalborg University](#)

Citation for published version (APA):

Smedskjær, M. M. (2014). *Hardness and Crack Resistance of Oxide Network Glasses*. Abstract from 38th International Conference and Expo on Advanced Ceramics and Composites, Daytona Beach, United States. <http://ceramics.org/meetings/38th-international-conference-and-expo-on-advanced-ceramics-and-composites>

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal -

Take down policy

If you believe that this document breaches copyright please contact us at vbn@aub.aau.dk providing details, and we will remove access to the work immediately and investigate your claim.

Hardness and Crack Resistance of Oxide Network Glasses

Morten M. Smedskjaer

Section of Chemistry, Aalborg University, DK-9000 Aalborg, Denmark

Predicting the properties of new glasses prior to manufacturing is a topic attracting great industrial and scientific interest, but the lack of long-range order and the long time scales for relaxation greatly complicate the traditional modeling efforts. Mechanical properties are currently of particular interest given the increasing demand for stronger, thinner, and more flexible glasses in recent years. Here we review our recent findings on predicting and understanding the indentation derived mechanical properties of oxide network glasses of industrial interest. For example, we have enabled quantitative calculations of glass hardness using temperature dependent constraint theory. We have also revealed the effects of different composition variables, thermal history, pressure history, and humidity on hardness and crack resistance of borosilicate and aluminosilicate glasses.